

KONDRAT'YEV, K.Ya., dotsent; GAYEVSKAYA, G.M., student.

Moisture turbidity and the determination of the amount of water in
the atmosphere. Nauch. biul. Len. un. no.32:7-8 '54. (MLBA 10:4)

1. Kafedra fiziki atmosfery.
(Humidity) (Atmospheric transparency)

KONDRAT'YEV, K.Ya., dotsent; GROMOVA, T.N., student.

Changes in the turbidity resulting from the coalescence of water droplets suspended in the atmosphere. Nauch. biul. Len. un. no. 32: (MLRA 10:4)
8-11 '54.

1. Kafedra fiziki atmosfery. (Humidity) (Atmospheric transparency) (Light--Scattering)

KONDRAT'YEV, K.Ya., dotsent; PIVZNER, S.I., student.

Interrelationship between streams of energy and light radiation.
Nauch. biul. Len. un. no.32:12-13 '54. (MLRA 10:4)

1. Kafedra fiziki atmosfery.
(Solar radiation)

KONDRAT'YEV, K.Ya.; PODOL'SKAYA, E.L.

On the theory of IANISHEVSKII's pyrgeometer. Vest.Len.un.9 no.5:
103-117 My '54. (MLRA 9:7)
(Earth--Radiation) (Radiation--Measurement)

KONDRAT'YEV, K. YA.

AID P - 2495

Subject : USSR/Meteorology

Card 1/2 Pub. 71-a - 5/26

Authors : Kondrat'yev, K. Ya., and Kudryavtseva, L. A., Kands.
Phys. and Math. Sci.

Title : On the albedo of the sea surface

Periodical : Met. i Gidro., 3, 25-27, My-Je 1955

Abstract : The computation of the albedo of large bodies of water is usually made theoretically on the basis of the Fresnel formula. The article reports on experiments in calculating the albedo of the calm sea surface under a cloudless sky for diffused and total radiation disregarding the inverse diffusion factor by computing the height of the sun and the diffusion angle at any given moment. The authors maintain that this method is more accurate than a theoretical analysis according to the Fresnel formula. A table giving albedo data and a diagram showing the dependence of the albedo

KONDRAT'YEV, K. Ya.

USSR/Physics

Card 1/1 Pub. 127 - 9/12

Authors : Kondrat'ev, K. Ya.; Kudryavtseva, L. A.; and Manolova, M. P.

Title : Distribution of the energetic (thermal) and light intensities of dispersed radiation of the atmosphere over the celestial vault

Periodical : Vest. Len. un. ser. mat. fiz. khim. 5, 119-128, May 1955

Abstract : An experimental study of the distribution of the thermal (energetic) and light intensities of the atmosphere over the celestial vault is described. A pyranometer of Yanishevskiy was used for measuring the thermal intensity of dispersed radiation and the light intensity was measured with a photo-selenium element. Eight references: 1 German and 7 USSR (1936-1954). Graphs; tables.

Institution :

Submitted : April 19, 1955

KONDRAT'YEV, K. Ya.

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551 521.2.3

g/s

and counter-radiation in the sky] Akademi. Nauk SSSR, Izvestiya Ser. Geofiz. No. 3, 1955, Sept./Oct. 1955, 5 figs., table, 3 eqs. DLC—Approximate theoretical formulas are derived for calculating the relative intensity of the effective radiation of the earth's surface and of the counter-radiation of the atmosphere for a clear sky and complete and partial cloudiness. In the absence of an inversion, the actual atmosphere can be considered quasi-isothermal in relation to the distribution of effective radiation and counter-radiation of the sky. In case of an inversion, it is necessary to take into account a stratification correction. The results of experimental determinations of effective radiation and atmospheric counter-radiation confirm the theoretical formulas. Shved. Meteorol. . Effective radiation . Sky radiation.
—Trans. of authors' abstract.

EE 107

AID P - 3844

Subject : USSR/Meteorology

Card 1/1 Pub. 71-a - 7/35

Authors : Kondrat'yev, K. Ya., M. P. Manolova

Title : ~~On the occurrence of diffused and total radiation on a sloping surface~~
On the occurrence of diffused and total radiation on a sloping surface

Periodical : Met. 1. gidr., 6, 31-34, N/D 1955

Abstract : The authors give a theoretical analysis of the angle of radiation diffusion on the basis of tests made at the Karadag actinometric observatory in June-July 1953. Some data on the diffusion angle under cloudless and cloudy skies are given in tables. Three diagrams. Two Russian sources, 1950, 1952.

Institution : None

Submitted : No date

KONDRAT'YEV, K. YA.
MAMONTOVA, L. I.

APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000824210017-6

"Solar energy." K. IA. Kondrat'ev. Reviewed by L. I. Mamontova.
Izv. Vses. geog. ob-va 87 no. 4: 378-380 J1-Ag'55. (MLRA 8:10)
(Solar radiation) (Kondrat'ev, K. IA.)

PHASE I BOOK EXPLOITATION

450

Kondrat'yev, Kirill Yakovlevich

Luchistyy teploobmen v atmosfere (Radiant Heat Exchange in the Atmosphere)
Leningrad, Gidrometeoizdat, 1956. 419 p. 3,000 copies printed.

Ed. (title page): Tverskiy, P. N., Professor; Ed. (inside book): Vlasova,
Yu. V.; Tech. Eds.: Braynina, M. I. and Soloveychik, A. A.

PURPOSE: This systematic presentation of basic problems in thermal radiation, the radiative balance of the atmosphere and subjacent surfaces, and the radiant inflow of heat into the atmosphere, is intended for science workers, advanced students and those concerned with problems in physics of the atmosphere, astrophysics, climatology, agroclimatology and thermal radiation.

COVERAGE: Radiant energy is the main source of energy for all processes occurring on the earth. Heat transfer is an important factor in the thermal balance between the earth and the atmosphere. The present

Card 1/10

monograph analyzes problems posed in the above mentioned fields. The eight chapters of the book are summarized as follows: Chapter I presents basic principles and concepts. The problem of radiation from the surface of an absolutely black body is discussed and the methods of computing the thermal radiation of material bodies is described. In Chapter II the theory of actinometric measurements of thermal radiation streams is presented. Chapter III discusses the absorption of longwave radiation in the atmosphere and gives approximate methods of computing such absorption. Chapter IV presents the general problem of heat radiation transfer in the atmosphere. Chapter V studies approximate methods of computing thermal radiation streams. Radiation into space extensively discussed. Chapter VI considers the determination of counter-radiation in the atmosphere and effective radiation of the subjacent surfaces, both of great practical importance. Chapter VII presents the results of research in the radiative balance of the atmosphere and subjacent surfaces and the earth-atmosphere system. Chapter VIII undertakes the solution of the radiant heat exchange problem, the cause of variations in atmospheric temperatures. Consideration is given to differences in turbulent and radiant heat exchange. The author thanks Professor P. N. Tverskiy and Professor A. A. Dmitriyev for advice and assistance in preparing the manuscript.

2/10

KONDRAT'YEV, K.Ya.; LOGINOVA, Z.A.

Direct methods for determining the temperature of soil surfaces.
Vest.Len.un.11 no.22:79-86 '56. (MLBA 10:2)
(Thermometry) (Soil physics)

YELOVSKIKH, M.P.; KONDRAT'YEV, K.Ya.; YAKUSHEVSKAYA, K.Ye.

Atmospheric absorption functions for heat radiation. Uch.zap.Len.
un. no.210:3-8 '56. (MLEA 9:8)
(Atmospheric temperature) (Solar radiation)

KONDRAT'YEV, K.Ya.

Applicability of diffusion concepts to the problem of calculating
the radiant inflow of heat in the atmosphere. Uch.sap.Len.un.
no.210:20-28 '56. (MLRA 9:8)

(Atmospheric temperature)

KONDRAT'YEV, K.Ya.

The Shvartschil'd approximation method in the theory of radiation
transmission. Uch.sap.Len.un. no.210:29-39 '56. (MLBA 9:8)
(Solar radiation)

KONDRAT'YEV, K.Ya.; MANOLOVA, M.P.

Arrival of scattered radiation on the surface of a slope during a
cloudless sky and acontinuous cloud cover. Uch.sap.Len.un. no.210:
40-46 '56. (MLRA 9:8)

(Solar radiation)

KONDRAT'YEV, K. YA

14-1-481

Translation from: Referativnyy Zhurnal, Geografiya, 1957, Nr 1,
p. 53 (USSR)

AUTHORS: Kondrat'yev, K. Ya. and Ter-Markaryants, N. Ye.

TITLE: Reflection of Radiation by the Sea (Ob otrazhenii
radiatsii morem)

PERIODICAL: Uch. zap. LGU, 1956, Nr 210, pp. 47-56

ABSTRACT: The calculation according to the Fresnel formula of the amount of radiation reflected by water does not take into account the reflection of diffused radiation, the counter diffusion of radiation by the ocean, and the swells of the sea which change the albedo in relation to a smooth surface. In June - July, 1954, the Main Geophysical Observatory and Leningrad University organized at the Black Sea (Karadag) comprehensive measurements of the ocean's albedo at different heights of the sun, the flux of the radiation coming from the water, the direct solar and diffused radiation, and also measurements of the distribution according to the angular intensity of the radiation diffused on the sky. The method used for these measurements is described by D. L. Grishchenko

Card 1/3

KONDRAT'YEV, K. Ya.

14-1-565

Summary translation from: Referativnyy Zhurnal, Geografiya, 1957,
Nr 1, p. 64 (USSR)

AUTHOR: Kondrat'yev, K. Ya., Yakushevskaya, K. Ye.

TITLE: A New Method for Calculating the Radiant Influx of Heat
(Novyy sposob rascheta luchistogo pritoka tepla)

PERIODICAL: Uch. Zap. LGU, 1956, Nr 210, pp. 57-63

ABSTRACT: A practical method for calculating radiant heat influx based on the premise of the homogeneity of the atmosphere along a horizontal level is presented. The radiant heat influx (LPT) is expressed by the formula $\xi = -dF/dz$, where F is the heat radiation current. The magnitude of the derivative is determined by the values of the transmission function derivative at different atmospheric levels. A radiant heat influx (LPT) formula, convenient for nomographic use, is obtained by using approximate radiation transference equations. Data on the transference function derivative is the basic initial material in making up the nomogram, which in turn permits detailed investigation of the vertical profile of radiational changes in atmospheric surface temperature. Scales provided by the

Card 1/2

A New Method for Calculating the Radiant Influx of Heat (Cont.)¹⁴⁻¹⁻⁵⁶⁵

nomogram are convenient for surface-stratum calculations;
for free atmosphere calculations, however, the scales
must be modified.

I. Sh.

Card 2/2

KONDRAT'YEV, K. Ya.:

KONDRAT'YEV, K. Ya.: "The transmission of radiant energy in the atmosphere."
Leningrad Order of Lenin State U imeni A. A. Zhdanov. Leningrad, 1956.
(DISSERTATION For the Degree of Candidate in PHYSICOMATHEMATICAL SCIENCE.)

So: Knizhanaya letopis', No. 24, 1956

KONDRATYEV, K. Ya.

"Transference of Heat Radiation in the Atmosphere and Associated Problems," paper submitted at International Assoc, of Meteorology Meetings, Toronto, Canada, 3-14 Sep 57

C-3,800,327

KONDRAT'YEV, K.Ya.

PHASE I BOOK EXPLOITATION

80V/1685

3(7)

Akademiya nauk SSSR. Komitet po geodezii i geofizike.

Tezisy dokladov na XI General'noy assambleye Mezhdunarodnogo geodezicheskogo i geofizicheskogo soyuza. Mezhdunarodnaya assotsiatsiya meterologii (Abstracts of Reports at the 11th General Assembly of the International Union of Geodesy and Geophysics. The International Association of Meteorology) Moscow, 1957. 38 p. /Parallel texts in Russian and English or French/ 1,500 copies printed. No additional contributors mentioned.

PURPOSE: This booklet is intended for meteorologists.

COVERAGE: These reports cover various subjects in the field of meteorology. Among the specific subdivisions discussed are: the heat balance of the Earth's surface, jet streams, transference of heat radiation, electric coagulation of cloud particles, turbulent diffusion, cloud studies, and others. Abstracts of all the articles are translated into either French or English. There are no references given.

TABLE OF CONTENTS:

Budyko, M.I. The Heat Balance of the Earth's Surface

Card 1/2

2

5

Система Ленинград Univ Ser 112 1000 112

Requirements of the system
in the form of a list of requirements

KONDRAT'YEV, K. Ya.

49-5-16/18

AUTHORS: Yelovskikh, M. P. and Kondrat'ev, K. Ya.

TITLE: Angular distribution of the intensity of thermal emission of the atmosphere. (Uglovoye raspredeleniye intensivnosti teplovogo izlucheniya atmosfery).

PERIODICAL: "Izvestiya Akademii Nauk, Seriya Geofizicheskaya" (Bulletin of the Ac.Sc., Geophysics Series), 1957, No.5, pp. 683-688 (U.S.S.R.)

ABSTRACT: In a previous paper (1) the authors gave the results of theoretical and experimental investigations of the angular distribution of the intensity of atmospheric emission. A number of problems were, however, left unsolved because of a lack of experimental data. In the present paper a more complete account of the above is given. These new results allow some conclusions to be made which are of interest in practice. The angular distribution of the intensity of the effective emission over the sky is characterised by the function $\zeta(\psi) = f(\psi)/f_0$ where $f(\psi)$ and f_0 are the intensity of the effective emission at a zenith angle ψ and in the direction of the zenith respectively. The distribution of the intensity of the counter-emission of the atmosphere relative to the vertical is characterised by the analogous function $\phi(\psi) = g(\psi)/g_0$. In the case of a

Card 1

Penetration

State Univ. in Zhdanov

49-5-16/18

Angular distribution of the intensity of thermal emission of the atmosphere. (Cont.)

clear sky the theoretical formulae (derived by one of the authors in Ref.2) has the form:

$$\zeta(\psi) = \frac{P_I(w_\infty \sec \psi)}{P_I(w_\infty)}$$

where $P_I(w_\infty)$ is the atmospheric transmission function for a directed radiation and w_∞ is the water vapour content of a column of the atmosphere having a unit cross section (in g/cm²). Further expressions which are available are the following:

(a) clear sky: $\zeta(\psi) = \cos^r \psi$ (empirical)

or $\zeta(\psi) = 1 - \frac{0.18 \gamma_m}{r(0)} (1 - \cos \psi) - \frac{11}{r(0)} \ln \frac{10}{\cos \psi}$

(b) cloudy sky:

$$\zeta(\psi) = \frac{P_I(w_h \sec \psi)}{P_I(w_h)}$$

Card 2

49-5-16/18

49-6-19/21

On the influence of the stratification on the thermal radiation of the atmosphere. (Cont.)

Thus, the model of the horizontal uniform atmosphere is fully satisfactory for the purpose of calculation of the counter radiation and the effective radiation.
There are 2 graphs and 4 Slavic references.

SUBMITTED: November 6, 1956.

ASSOCIATION: Leningrad State University imeni A. A. Zhdanov.
(Leningradskiy Gosudarstvennyy Universitet im.A.A.Zhdanova).

AVAILABLE: Library of Congress
Card 3/3

/Gondratyev, A.Y.
APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000824210017-6

A radiometer for measuring the intensity of the heat radiation of the atmosphere and comparison of the radiometer with the pyrgometer. Meteor. i gidrol. no.7:49-51 JI '57. (MLBA 10:8)
(Radiometer) (Heat--Radiation and absorption)
(Atmospheric temperature)

"APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000824210017-6

APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000824210017-6"

KONDRAT'YEV, K.Ya.; LOGINOVA, Z.A.

Indirect methods for the determination of earth surface temperature
based on standard actinometric data. [with summary in English, p.152].
Vest. Len. un. 12 no.4:79-84 '57. (NLRA 10:4)
(Earth temperature)

AUTHORS: Kondrat'yev, K. Ya., Manolova, M. P. 54-1-1/17

TITLE: The Daily Course and the Daily Sums of Scattered & Total Radiation on Slopes of Different Orientations
(Dnevnoy khod i dnevnyye summy rassoyannoy i summarnoy radiatsii na razlichno ori_yentirovannykh sklonakh)

PERIODICAL: Vestnik Leningradskogo Universiteta Seriya Fiziki i Khimii (Nr 1), 1958, Nr 4, pp. 5-16,

ABSTRACT: The initial values of the present paper are the results of the pyranometric measurements of scattered total radiation acting upon surfaces of different orientations. Investigations were carried out by the authors by means of Yanishevskiy's pyranometer. The latter was mounted on the stand of a theodolite in order that the receiving surface might be turned in any desired direction. Measurements were carried out in summer 1956 on days with a cloudless sky on a horizontal platform of the actinometric observatory of Karadag. Surfaces with gradients of 5, 10, 15, 20, 30, 50, 70 and 90°, which were directed towards South, North, East and West, were measured. It was found that the relative

Card 1/4

The Daily Course and the Daily Sums of Scattered & Total Radiation on Slopes of Different Orientations 54-1-1/17

amounts of total or scattered radiation in the case of a cloudless sky depend practically only upon the position of the sun and the direction of the slope. This means that the geographical position of the point of observation is of importance only with respect to whether the observed range (sun's altitude $h \ll 68^\circ$) extends to all possible modifications of the sun's altitude at the point concerned. If, however, the sum of total radiation is concerned, it is probably necessary to take into account not only the influence exercised by the sun's altitude and the gradient of the slope but also that of the length of the day. An analysis of the results obtained shows that in the case of slopes, the gradient of which amounts to not more than 100, the curves of the daily course of total- and especially of scattered radiation show only few modifications in different countries of the world. In the case of steep slopes, however, conditions change essentially. There is considerably less variation in the daily course of scattered and reflected radiation in connection with the direction of the slopes, and this is observed also in the case of vertical surfaces

Card 2/4

The Daily Course and the Daily Sums of Scattered & Total
Radiation on Slopes of Different Orientations

54-1-1/17

(fig. 3). It appears that differences with respect to the setting in of total radiation, which is due to different orientations of slopes in different countries, is caused mainly by the difference in the setting in of direct solar radiation. The results obtained by the present work show that for the determination of the sums of total radiation it is possible to employ quite simple methods for the surfaces of slopes of different orientations and gradients in the case of a cloudless sky. As already shown previously (reference 2), computation of the sums of total (scattered) radiation is even more simple if the sky is covered by a thick layer of clouds. The case of a sky, only partly covered by clouds can hardly be investigated either theoretically or experimentally. For the determination of the daily variation of scattered and total radiation on slopes of different orientations investigated on the basis of pyranometric measurements on cloudless days three methods of determining the daily sum of total radiation on slopes have been developed.

Card 5/4

AUTHORS: Kondrat'yev, K. Ya., Volkova, G. P. SOV/50-58-7-5/20

TITLE: Daily Course and the Possible Sums of the Summary Radiation
(Sutochnyy khod i vozmozhnyye summy summarnoy radiatsii)

PERIODICAL: Meteorologiya i gidrologiya, 1958, Nr 7, pp. 30-32 (USSR)

ABSTRACT: It was the authors' object to investigate, whether it is possible to investigate¹⁾ theoretically the summary radiation in the course of one day in the case of a cloudless sky, and by application of the results obtained to suggest a simple and reliable method of a theoretical calculation of the possible daily sums of the summary radiation. In the first place the formulae (1), (2) and (3) are to be examined:

$$F_2(0) = \frac{2 - \sec \vartheta_0}{2(1 - A) - (\sec \vartheta_0 - 2A) e^{\varepsilon_1 \tau_0 (\sec \vartheta_0 - 2)}} \times S_0 \cos \vartheta_0 \quad (1)$$

$$F_2(0) = \frac{2 - \sec \vartheta_0}{2 \sec \vartheta_0 e^{\varepsilon_1 \tau_0 (\sec \vartheta_0 - 2)}} \times S_0 \cos \vartheta_0 \quad (2)$$

Card 1/3

Daily Course and the Possible Sums of the Summary Radiation SOV/50-58-7-5/20

$$F_2(0) = \frac{S_0 \cos \vartheta_0}{1 + \varepsilon_1 \tau_0 \sec \vartheta_0} \quad (3)$$

It was necessary to determine the value of the parameter $\varepsilon_1 \tau_0$ for comparing the results obtained by observation with the theoretical calculations. A theoretical solution of this problem is, however, very difficult. If the mentioned formulae are assumed to be semi-empirical, the simpler formula (3) yields the best results. The comparisons carried out showed that a rather close connection exists between the parameter $\varepsilon_1 \tau_0$ and the transparency coefficient of the atmosphere. The daily sum of the summary radiation may be calculated according to the formulae of Gal'perin if only one measurement of the flux of the summary radiation at $m = \bar{m}$ and, in the case of cloudless sky which is necessary for the calculation of the parameter $\varepsilon_1 \tau_0$, is made. If, however, the dependence of this parameter on the transparency conditions of the atmosphere was already previously determined, this single observation is not necessary (in this case the transparency coefficient has of course to be known). From the data in Table 2

Card 2/3

Card 3/3

SOV-3-58-10-2/23

AUTHORS: Kondrat'yev, K.Ya., Professor and Shilov, L.A.

TITLE: Several Problems of University Education (O nekotorykh voprosakh universitetskogo obrazovaniya)

PERIODICAL: Vestnik vysshey shkoly, 1958, Nr 10, pp 17 - 23 (USSR)

ABSTRACT: Taking the experience of the Leningrad University as an example, the authors deal with a number of problems in the organization of university activity. The university's principal object at present is to raise the quality of the training of specialists. This can only be achieved by intensifying the contact between university, life and production, by combining study with actual labor in various forms, and by strengthening the material-technical basis of higher education. The regulations for admission should be altered and the organization of study and practical training thoroughly improved. Although adequate in some respects, the former method of enrolling secondary school graduates contained some serious shortcomings; students were inexperienced, were sometimes scornful towards physical labor, politically immature, etc. The enrollment of students at present and in the future will consist of persons having experience in life

Card 1/3

Card 2/3

Several Questions of University Education

SOV-3-58-10-2/23

pedience of a parallel existence of pedagogical vuzes and universities in large cities and point to the benefit derived from uniting small vuzes with large ones. In conclusion the authors deal with the question of propagating scientific knowledge, the post-graduate courses for raising the qualification of engineers and the 2-year courses for foreign languages, organized by Leningrad University.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet imeni A.A. Zhdanova (Leningrad State University imeni A.A. Zhdanov)

Card 3/3

The Radiation Balance of Slopes

54-10-2-5/16

16). As may be seen from illustrations the dependence of the relation R_o/R_r on the azimuth of the surface becomes insignificant in the case of higher altitudes of the sun. In the case of slopes facing the sun a maximum of the angle of inclination α of the order of $90^\circ - h_o$ is observed, which is especially clearly marked in the case of low altitudes of the sun. On slopes not facing the sun the curves R_o/R_r have a minimum. In this connection it is found that for individual values of α the radiation balance of the slope is negative for not very high altitudes of the sun. With an increase of the angle of inclination of the slope the radiation balance passes through zero if direct solar radiation does not touch the surface of the slope ($\alpha > h_o$). Steep slopes not facing the sun ($\alpha > 50^\circ$) have a positive balance, apparently because of the increasing current of reflected radiation and the decrease of effective actual radiation. On slopes with an azimuth of $90 - 270^\circ$ with respect to the sun a monotonous reduction of the quantities R_o/R_r is observed with an increase of the angle of inclination (fig. 16). In the case of low and medium altitudes of the sun, the slopes facing the sun have a considerably higher radiation balance than horizontal surfaces. In the case of a very high altitude of the sun and a large radiation balance, the radiation balance of the surface has either the same or (in most

The Radiation Balance of Slopes

54-10-2-5/16

cases) a lower radiation balance than a horizontal surface. A comparison (figs. 14 and 17) shows that the azimuth dependence of the radiation balance is much less marked in the case of cirro-stratus than if the sky is clear. Summarizing, it may be said that in this paper a method of calculating the components of the radiation balance of slopes during the warm half of the year has been developed according to known components of the radiation balance of the horizontal surface. When calculating the diffuse, reflected total radiation and effective actual radiation this task can be performed by the application of empirical diagrams characterizing the dependence of the relative amounts of the radiation balance components upon the gradient and the direction of the slope. For the purpose of calculating the sums of shortwave radiation isotropic approximation can be applied. There are 17 figures, 4 tables, and 22 references, 13 of which are Soviet.

SUBMITTED: September 23, 1957

AVAILABLE: Library of Congress

Card 3/3 1. ~~Sun--Radiation--Absorption~~

SOV/ 49-58-12-6/17

AUTHORS: Kondrat'yev, K. Ya. and Nedovesova, L. I.

TITLE: ~~On~~ the Thermal Radiation of Carbon Dioxide in the Atmosphere
(O teplovom izluchenii uglekislogo gaza v atmosfere)

PERIODICAL: Izvestiya akademii nauk SSSR, Seriya geofizicheskaya,
1958, Nr 12, pp 1470-1476 (USSR)

ABSTRACT: It was noticed that the carbon dioxide gas shows the intensive absorption band in the infra red end of the spectrum and therefore the thermal radiation of this gas represents a significant factor in the general radiation of the atmosphere. The purpose of this work is to determine the transmission function of the atmosphere at the 15μ band of the spectrum. 1 to apply this function for the determination of the relationship of the thermal radiation of the carbon dioxide and its concentration. The band 15μ is the only one which takes a part in transfer of thermal radiation. The determination methods of the absorption in this band were investigated by various authors; some of the results are given in Fig.1, where the relation of the absorption to the quantity of CO_2 is shown. A function (1) can be derived for

Card 1/3

SOV/ 49-58-12-6/17

On the Thermal Radiation of Carbon Dioxide in the Atmosphere

these results. However, the formula (2) could be applied in the general case, where (P_J) and (P_F) are the transmission functions for the direct and diffuse radiation respectively (δ - angle of zenith). It is possible to determine the value P_F for every u but the author considers that a better method could be applied based on Eq.(3), where the diffusion coefficient β could be considered as equal to 1.80 for the large values of u . For the small u (ranging from 10^{-2} to 10^{-3} cm), the value of β becomes variable. Therefore the calculations could be based on Eq.(2) for the exact value of P_F , and on Eq.(3) for its intermediate values. The result of the calculation is shown in Table 1. Eq.(4) can be applied for the calculation of the coefficient of absorption of water vapour in the band of the spectrum 12 - 18 μ (Ref.7). In order to deduce the coefficient for the CO_2 , the relationship (5) can be applied. Thus the transmission function for the mixture of CO_2 and H_2O in the band 15 μ can be found (an example is shown in Table 1). The values of u , related to both gases, can be determined from the formulas (6) and (7). It can be estimated that the

Card 2/3

SOV/ 49-58-12-6/17

On the Thermal Radiation of Carbon Dioxide in the Atmosphere

coefficient defining the percentage of the thermal radiation σT^4 for the 15μ band of the spectrum is equal to $P_j=0.264$.

Therefore the total thermal radiation of the atmosphere for this band can be calculated. The results of this calculation are shown in Table 2 for 2 stratifications, I - near the earth surface and, II - free atmosphere. There are 2 tables, 1 figure and 7 references; 3 of the references are Soviet, 3 are English and 1 is Czech.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University, im. A. A. Zhdanov)

SUBMITTED: October 18, 1957.

Card 3/3

24(4)

AUTHOR:

Kondrat'yev, K. Ya.

SOV 54-59-2-24/24

TITLE:

Conference on Actinometry and Atmospheric Optics (January 28, to February 4, 1959) (Soveshchaniye po aktinometrii i atmosferno optike (28 yanvarya-4 fevralya 1959))

PERIODICAL:

Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1959, Nr 2, pp 156 - 158 (USSR)

ABSTRACT:

The Conference was convened by the Leningrad University together with the Komissiya po fizike atmosfery OEN AN SSSR (Commission on the Physics of the Atmosphere of the AS USSR) and Glavnaya geofizicheskaya observatoriya (Main Observatory for Geophysics). The Conference lasted for 8 days and in total 102 lectures were held, which dealt with the following problems: 1) Radiation balance and its production; 2) Luminosity and polarization of the day-time and twilight sky; 3) Transparency of the atmosphere; 4) Investigation of the atmospheric aerosols by means of optical methods; 5) On the capability of reflection of the earth's surface; 6) Radiation and building; 7) Theory of radiation transmission in the atmosphere; 8) Methods of actinometric measurement. More than 300 persons attended the Conference; mainly institutions from various towns of the Soviet Union were represented. The Conference was also attended by

Card 1/4

Conference on Actinometry and Atmospheric Optics
(January 28, to February 4, 1959)

SOV/54-59-2-24/24

representatives of China, Poland, Hungary, Czechoslovakia, and Bulgaria. It was opened by Professor A. M. Obukhov, Corresponding Member of the AS USSR, Chairman of the Commission of Physics of the Atmosphere at the QFAN of the AS USSR. The first lectures delivered after the first day of the Conference by K. Ya. Kondrat'yev, G. V. Rozenberg, Yu. D. Yanishevskiy and S. I. Sivkov dealt with the results of radiation research in the last 15 years. The prospects of development for the next 7 years were equally discussed. The majority of the lectures dealt with the first problem, i.e. with the rules governing the changes of radiation balance (T. V. Kirillova, P. A. Vorontsov, K. Ya. Kondrat'yev, M. P. Manolova, Ye. P. Basmakova, L. I. Sakali, A. I. Kartsivadze), problems of systematizing the results of actinometry (L. G. Makhotkin), integral transparency of the atmosphere (Sh. M. Chkhaidze), theoretical computations of the radiation current (N. A. Yefimova, B. M. Gal'perin, M. S. Marshanova, V. S. Samoilenko), on the characteristic features of the geographical distribution of the types of radiation (T. G. Berlyand, V. L. Gayevskiy, Z. I. Pivovarova, R. Ye. Borichevskiy, A. I. Popov, V. V. Mukhanberg, T. A. Ogneva), on the types of radiation under arctic and antarctic conditions (N. T. Cherbegovskiy, N. P. Rusin, M. K. Gavrilova,

Card 2/4

Conference on Actinometry and Atmospheric Optics
(January 28, to February 4, 1959)

SOV/54-59-2-24/24

V. N. Bogoslowski). The investigations in field 5) are closely related with these problems (on the albedo of various soil surfaces (V. I. Matulyavichene, Kh. G. Tocoming)), aerial measurements (N. I. Goysa), albedo of the sea (N. Ye. Ter-Makaryants), spectral albedo (K. Ya. Kondrat'yev, Z. F. Mironova, L. V. Dayeva) and on the spectral luminosity of the natural formations (K. S. Lyalikov, L. B. Krasil'shchikov). Papers by A. U. Franchuk, A. N. Borshchevskiy, B. F. Vasil'yev, Ye. Yu. Braynina, B. A. Dunayev) are in connection with problem 6). The second circle of problems which was dealt with at the Conference were the problems of the action of ultraviolet rays on the human organism (N. F. Galanin, A. N. Boyko, N. A. Isadev, A. P. Andreytsev, O. E. Shelkova). In this connection a lecture was delivered on the photomultipliers and photocells used at present (A. L. Osherovich). On problems of field 8). Beside general lectures (Yu. D. Yanishevskiy) also theoretical (E. D. Podal'skaya), experimental (D. L. Grishchenko) problems were dealt with; Utilization of electronic potentiometers, (Yu. K. Ross, V. I. Mamayenko), elaboration of the results (F. Zakrilayev, R. Ye. Borichevskiy). Field 7) elaboration of the approximation equations for radiation transmission (Kondrat'yev, K. Ya.) and on some theoretical problems

Card 3/4

Conference on Actinometry and Atmospheric Optics
(January 28, to February 4, 1959)

SOV/54-59-2-24/24

(Ye. M. Feygel'son, M. S. Malkevich, S. D. Gutshabash, I. N. Minin, G. B. Rozenberg, S. G. Slyusarev, A. M. Samson, K. S. Shifrin, N. P. Pyatovskaya, V. S. Atroshenko, O. A. Avaste). Ad (2)
lectures were delivered by (Ye. V. Pyaskovskaya-Fesenkova, Yu. N. Lipskiy, N. K. Tarikova, A. Ya. Driving, G. V. Rozenberg, D. G. Stamov, T. G. Magrelishvili, A. D. Zamorskiy, L. Kh. Darchiya, M. M. Fedorov, V. V. Sharonov), point 3) (Ye. V. Pyaskovskaya-Fesenkova, T. P. Toropova, V. G. Kastrov, V. G. Faraponova, N. V. Zolotavina, Yu. I. Rabinovich, V. I. Myukhyurya, Ye. A. Polyakova, O. I. Popov, A. M. Braunshteyn, M. V. Zuyev, N. I. Nikitinskaya, M. V. Dolidze), point 4) (K. S. Shifrin, V. F. Raskin, O. D. Barteneva, T. P. Toropova, G. V. Rozenberg, N. D. Rudometkina, I. M. Mikhaylin, B. A. Chayanov, N. V. Zolotavina, A. Ya. Driving, B. I. Styro). At the end of the Conference it was decided to hold an extensive conference on the problems of actinometry and atmospheric optics in May-June 1960 which will be convened by the Institute of Geology and Geography of the AS Latvian SSR.

Card 4/4

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66302

AUTHORS: Kondrat'yev, K. Ya., Filipovich, O. P. SOV/50-59-12-12/23

TITLE: On the Theory of Thermal Conditions in the Upper Atmosphere

PERIODICAL: Meteorologiya i gidrologiya, 1959, Nr 12, pp 41-48 (USSR)

ABSTRACT: The results of the theoretical investigation of factors determining the vertical temperature distribution in the upper atmosphere are dealt with. Recent experimental data and theoretical results refute the conception of a radiation equilibrium in the stratosphere. Data of actinometric radio balloons show that active radiation changes with the altitude not only in the troposphere but also in the stratosphere. The paper by Ohring (Ref 31) is thoroughly discussed. The most important conclusion from this paper is that the stratosphere as a whole (between the tropopause and the 55 km level) is not in a radiation equilibrium. Although the papers (16, 20, 24, 36) convincingly show that the thermal conditions of the stratosphere are primarily controlled by radiation, the problem of the part played by other factors (in particular that of turbulent mixing) has remained unclarified up to date. On the basis of the papers (7, 30, 32) it can be said that an extensive area of the mesosphere (between 35 and 80 km altitude), from 30° on the northern

Card 1/3

66302

On the Theory of Thermal Conditions in the Upper
Atmosphere

SOV/50-59-12-12/23

This means that a gradual temperature rise occurs in the outer
terrestrial atmosphere up to the temperature of the "hot" inter-
planetary gas. There are 5 figures, 2 tables, and 42 references,
14 of which are Soviet.

4

Card 3/3

KONDRAT'YEV, K.Ya.

APPROVED FOR RELEASE: 06/19/2000

CIA-RDP86-00513R000824210017-6

Conference on actinometry and atmospheric optics (January 28 -
February 4, 1959). Vest.LGU 14 no.10:156-158 '59.

(MIRA 12:6)

(Geophysics--Congresses)

KONDRAT'YEV, K.Ya...prof.

Problems of actinometry and atmospheric optics. Vest. AN SSSR
29 no.4:118-120 Ap. '59. (MIRA 12:5)
(Solar radiation)

3 (3), 3 (7)
AUTHORS:

Kondrat'yev, K. Ya., Rozenberg, G. V. SOV/53-68-2-6/7

TITLE:

Conference on Actinometry and Atmospheric Optics
(Soveshchaniye po aktinometrii i atmosfernoy optike)

PERIODICAL:

Uspekhi fizicheskikh nauk, 1959, Vol 68, Nr 2,
pp 345-358 (USSR)

ABSTRACT:

The conference on actinometry and atmospheric optics, that had been organized by the Committee of Atmospheric Optics of the OPNI AS USSR, by the Leningrad University and the Glavnaya geofizicheskaya observatoriya (Geophysical Main Observatory) was held in Leningrad from January 28 to February 4, 1959. Preparatory work was made by a subcommittee for radiation of the Committee of Physics of the Atmosphere, to which belonged: K. Ya. Kondrat'yev (Chairman, LGU Leningrad), G. V. Rozenberg (Vice President IFA AS USSR, Moscow), V. G. Kastrov (TsAO, Moscow), Ye. V. Pyaskovskaya-Pesenkova (Astrofiz. in-t - Astrophysics Institute, Kazakh SSR, Alma-Ata), G. K. Sulakvelidze (Elbrus Expedition of the IPG AS USSR, Nal'chik), K. S. Shifrin (GGO, Leningrad), Yu. D. Yanishevskiy (GGO, Leningrad). The conference was attended by 325 delegates from 33 cities, astronomical

Card 1/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

observatories and actinometric stations. Other delegates had been sent by China, Poland, East Germany, Czechoslovakia, Bulgaria and Korea. 102 lectures were delivered, which may be classified in the following groups with respect to their subjects: 1) Radiation equilibrium and its composition, 2) Brightness and polarization of daytime- and crepuscular sky, 3) Atmospheric transparency, 4) Investigation of the atmospheric aerosol by optical methods, 5) Reflecting capability of lower strata, 6) The conference was opened by the Chairman of the Committee of Atmospheric Physics, A. M. Obukhov, Corresponding Member, AS USSR. K. Ya. Kondrat'yev (LGU, Leningrad) held an introductory speech on results and prospects of development in actinometry and atmospheric optics. G. V. Rozenberg (IFA, AS USSR, Moscow) spoke on the development of atmospheric optics and Yu. D. Yanishevskiy (GGO, Leningrad) on the actinometric network of the USSR and the IGY. S. I. Sivkov (GGO, Leningrad) spoke on actinoclimatology, L. G. Makhotkin (GGO, Leningrad) on the systematic arrangement of data in actinometry and P. A. Vorontsov and T. V. Kirillova (GGO, Leningrad) on the connection of radiation equilibrium with the stratification

Card 2/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

of the earth-near stratum. Further lectures were delivered by: Ye. P. Barashkova (GGO, Leningrad) on rules governing the radiation conditions, L. I. Sakali (GMI, Odessa) on radiation equilibrium in the lower strata over land and sea, K. Ya. Kondrat'yev and M. P. Manolova (LGU, Leningrad) on the radiation equilibrium in slopes, F. Zakrilayev (Tashkent) on the development of actinometry and atmospheric optics in Central Asia, A. I. Kartsivadze (Institut geofiziki AN GruzSSR - Institute of Geophysics of AS GruzSSR, Tbilisi) on the determination of the angle of incidence of sun beams on inclined planes, Sh. M. Chkhaidze (Abastumanskaya astrofiz. obs. - Abastumanskaya Astrophysical Observatory) on astrophysical observations made in this observatory, T. G. Berlyand (GGO, Leningrad) on the propagation of sun radiation over the globe, Ye. P. Barashkova, V. L. Gayevskiy and Z. I. Pivovarova (GGO, Leningrad) on radiation conditions in the European part of the USSR, and N. A. Yefimova (GGO, Leningrad) on the application of climatological methods of calculating the effective total radiation, and utilization of data from 68 actinometric stations of the USSR. B. M. Gal'perin (LGMI, Leningrad) spoke of the influence exerted by an overcast

Card 3/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

upon the thermal irradiation of atmosphere and R. Ye. Borichevskiy (Agrometstantsiya, Omsk) on the work carried out by this station; A. I. Popov (Sel'skokhoz. in-t. - Agricultural Institute, Krasnoyarsk) spoke of the total and scattered radiation in the Krasnoyarskiy kray, V. V. Mukhenberg and T. A. Ogneva (GGO, Leningrad) reported on local radiation investigations (Crimea). S. I. Sivkov (GGO, Leningrad) spoke about actinometry in agriculture and N. P. Rusin (GGO, Leningrad) spoke about investigations of radiation equilibrium made by the Soviet Antarctic Expedition. V. N. Bogoslovskiy (MISI, Moscow) reported on thermophysical and glacial-actinometric investigations in the Antarctica 1957-1958 and N. T. Chernigovskiy (ANII, Leningrad) as well as M. K. Gavrilova (Yakutsk), B. M. Gal'perin (LGMI, Leningrad), T. V. Kirillova (GGO, Leningrad) and M. S. Marshunova (ANII, Leningrad) likewise reported on actinometric and climatological investigations in the Antarctica. V. S. Samoylenko (NII aeroklimatologii - Scientific Research Institute of Aeroclimatology, Moscow) reported on investigations of the radiation thermal conductivity in the sea and the atmosphere, and together with A. I. Sirotkina on

Card 4/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

problems of solar irradiation and water temperature in the Aral and Caspian Sea. A number of lectures on the subject: radiation and construction engineering was introduced by A. U. Franchuk (In-t stroitel'stva i arkhitektury AN BSSR, Minsk - Institute of Construction Engineering and Architecture, AS BSSR, Minsk) with a lecture on the influence of solar radiation upon the external surfaces of buildings. Further lectures were delivered by: B. F. Vasil'yev (NII zhilishcha AS i A SSSR, Moscow) on the role played by the reflected radiation in the southern regions of the USSR, B. A. Dunayev on the consideration of radiation when projecting buildings, as well as Ye. Yu. Braynina, A. N. Borshchevskiy (NII-200, Moscow) likewise on architectural problems in connection with radiation. The following reports dealt with problems of actinometric measurement: Yu. D. Yanishevskiy (GGO, Leningrad) on construction principles of Soviet and foreign actinometric instruments, and on the compensation pyrheliometer and its application, E. L. Podol'skaya (LGU, Leningrad) on the theory of the balansometer, Yu. K. Ross (In-t fiziki i astron. AN ESSR, Tartu - Institute of Physics and Astronomy of the AS ESSR, Tartu) spoke of the application of electronic

Card 5/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

potentiometers in actinometry and V. I. (Mamayenko IFA AS USSR, Moscow) on the application of the instrument EPP-09 for radiation recording, F. Zakrilayev (Sredneaz. politekhn. in-t, - (Soviet) Central Asiatic Polytechnic Institute, Tashkent) on temperature coefficients of actinometric instruments, R. Ye. Borichevskiy (Agrometstantsiya, Omsk) on new apparatus, observation methods and utilization of materials in the Omsk agrometstantsiya. Other lectures were delivered by: D. L. Grishchenko on methods of maritime actinometric observations, Ye. V. Pyaskovskaya-Fesenkova (Alma-Ata) on visual observations of polarization of the day-light in the Libyan Desert and D. G. Stamov (Krymsk. pedagogich. in-t - Crimea Pedagogical Institute, Simferopol') on the polarimetric determination of the moisture of atmosphere in different directions. S. I. Sivkov (GGO, Leningrad) reported on depolarization phenomena of light in the atmosphere, Yu. N. Lipskiy (GAISH MGU, Moscow) on the spectral polarization of the day- and crepuscular sky, N. K. Turikova, A. Ya. Driving, G. V. Rozenberg (IFA AS USSR, Moscow) reported on photoelectric investigations of the brightness

Card 6/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

of day- and crepuscular sky in the Northern Caucasus and on the Crimea; T. G. Megrelishvili (Abastuman Astrophysical Observatory) reported on investigations of optical properties of the earth atmosphere in crepuscle. G. V. Rozenberg spoke of the "Anatomy of Sunset", A. D. Zamorskiy (Leningrad) of the physical nature of the phenomena in the pink-red (purple) sky at sunset, M. M. Fedorov (Pedagogich. in-t - Pedagogical Institute, Zaporozh'ye) on illumination and density of damp in the Zaporozh'ye region, V. V. Sharonov (LGU, Leningrad) on the determination of light constants of the sun and the moon, T. P. Toropova (Alma-Ata) on factors of light reduction in the atmosphere, N. V. Zolotavina (IFA AS USSR) on measurements of the transparency of the atmosphere, M. V. Dolidze (Abastuman Astrophysical Observatory) on measurements of spectral transparency on the mountain Kanobili. Further lectures dealt with the altitude dependence of transparency: V. G. Kastrov (TsAO, Moscow) spoke about the pyranometric determinations of the sunlight absorption in the atmosphere, G. P. Faraponova (TsAO, Moscow) on light reduction in the free atmosphere, Yu. I. Rabinovich (GGO, Leningrad) on the

Card 7/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

vertical distribution of the reduction coefficient in the lower troposphere, G. P. Gushchina (GGO, Leningrad) on the irradiation of atmospheric aerosols, V. I. Myukhkyur'ye on the light reduction by aerosols at different altitudes, Ye. V. Pyaskovskaya-Fesenkova (Alma-Ata) on the determination of transparency coefficients from the brightness of the sky, N. I. Nikitinskaya (Lesotekhnicheskaya Akademiya - Technical Academy for Forestry, Leningrad) on determinations of the spectral transparency of the atmosphere, Ye. A. Polyakova (GGO, Leningrad) on the horizontal transparency in a precipitation zone, O. I. Popov (GOI, Leningrad) on the photoelectric recording instrument GOI (FM-45), A. M. Brounshteyn (GGO, Leningrad) on methods and measuring results concerning the function of the passage of longwave radiation, V. A. Zuyev on the horizontal transparency of the atmosphere for infrared, A. L. Osherovich (LGU, Leningrad) on parameters of modern photomultipliers and photocells, A. P. Andreytsev and O. P. Shelkova (In-t biofiziki AN SSSR - Institute of Biophysics of the AS USSR, Moscow) dealt with an instrument devised by them for the measurement of natural UV-radiation, N. F. Galanin (In-t radiats. gigiyeny -

Card 8/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

Institute of Radiation Hygiene, Leningrad) on the effect of UV-radiation on the human organism, A. N. Boyko (VNIIM, Leningrad) on the UV-radiation of the sun as a climatic factor, N. A. Lebedev (Crimea Pedagogical Institute, Simferopol') on observations of the solar UV-radiation on the Crimea. Problems of atmospheric aerosols were dealt with by K. S. Shifrin and V. F. Raskin (GGO, Leningrad), O. D. Bartenev (GGO, Leningrad), T. P. Toropova (Alma-Ata), B. A. Chayanov (TsAO, Moscow), G. V. Rozenberg, N. D. Rudometkina and I. M. Mikhaylin (IFA AS USSR, Moscow); reports chiefly dealt with investigations of the scattering indicatrix and its components. N. V. Zolotavina, A. Ya. Driving and G. V. Rozenberg (IFA AS USSR, Moscow) spoke about atmospheric sounding, A. Ya. Driving (IFA AS USSR) on clouds in the stratosphere according to sounding data, B. I. Styro (In-t geologii i geografii AN Litovskoy SSR - Institute of Geology and Geography, AS Lithuanian SSR) on the distribution of radioactive aerosols in the free atmosphere, L. B. Krasil'shchikov (GGO, Leningrad) on measurements of brightness coefficients under laboratory conditions and in the open air, K. S. Lyalikov (Labor. aerometodov AN SSSR - Laboratory for

Card 9/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

Aeromethods of the AS USSR, Leningrad) on investigations of the spectral brightness, V. I. Matulevichene (Gos. universitet, Vil'nyus - State University, Vilna) on albedo-measurements and computations, N. Ye. Ter-Markaryants (GGO, Leningrad) on radiation reflection by the sea, K. Ya. Kondrat'yev, Z. F. Mironova and L. V. Bayeva on the spectral albedo of snow, Kh. G. Toominga (Tartu, on the course of the surface albedo during one day and H. I. Goysa (Ukr. NIGMI, Kiyev) on albedo measurements of large territories by the aid of an airplane. Other lectures were devoted to problems of the radiation transfer in the atmosphere. Lecturers were: K. Ya. Kondrat'yev (LGU, Leningrad) on approximation equations for the radiation energy transfer, Ye. M. Feygel'son (IFA AS USSR, Moscow) on temperature changes in a cloud with time, A. M. Samson (In-t fiziki i matematiki AN BSSR - Institute of Physics and Mathematics AS BSSR, Minsk) on the transfer of resonance radiation in a plane-parallel stratum, I. N. Minin (LETI, Leningrad) on a radiation transfer equation under consideration of refraction, G. V. Rozenberg (IFA AS USSR, Moscow) on light conditions in the depth of a scattering medium, S. G. Slyusarev (LGMI, Leningrad) on the

Card 10/11

Conference on Actinometry and Atmospheric Optics

SOV/53-68-2-6/7

radiation field in the depth of a turbid medium, M. S. Malkevich (IFA AS USSR, Moscow) on results given by an approximation method devised by him for the consideration of the horizontal albedo change of the ground surface in the problem of light propagation in the atmosphere with a spherical scattering indicatrix, S. D. Gutshabash (VMU, Leningrad) on light scattering in a medium adjacent to a reflecting surface, V. A. Atroshenko (IFA AS USSR, Moscow) on evaluations of the accuracy of the transfer equation solution according to the method by V. V. Sobolev and O. A. Avaste (In-t fiz. i astron. AN ESSR, Tartu - Institute of Physics and Astronomy of the AS ESSR, Tartu) concerning the accuracy of an approximation method for the calculation of the brightness in atmospheric fog (Sobolev method). The next conference of this kind is to be held in Vilna in 1960.

Card 11/11

SOV/4878

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PHASE I BOOK REVIEW

CIA-RDP86-00513R000824210017-6

Kondrat'yev, Kirill Yakovlevich and Ol'ga Petrovna Filipovich
 Teplovoy rezhim verkhnikh sloev atmosfery (Thermal Regime in the Upper
 Atmosphere) Leningrad, Gidrometeoizdat, 1960. 355 p. 3,000 copies printed.
 Resp. Ed.: K. Ya. Kondrat'yev; Ed.: Yu. V. Vlasova; Tech. Ed.: M. I. Braylina.
PURPOSE: This book is intended for scientists interested in the physics and
 meteorology of the upper layers of the atmosphere. It will also be useful to
 advanced students of the field.
COVERAGE: The book systematically analyzes problems concerning the thermal regime
 in the upper layers of the atmosphere. Numerous observational data are pre-
 sented and basic theoretical ideas, explaining the regularities of the thermal
 regime, are put forth. The latest scientific information on the composition
 and structure of the upper layers of the atmosphere is characterized in detail.
 Chapters III-VII were written by Kondrat'yev; Chapters I-II and VIII-X were
 written by Filipovich. The authors thank V. P. Gurov, S. F. Rodionov, S. I.
 Titov, and Ye. G. Shvidkovskiy. There are 472 references: 190 Soviet, 272
 English, 7 German, and 3 French.

Ca

Card 1/6

113
115

Thermal Regime in the Upper (Cont.)

SOV/4878

3. Frequency of electron collisions	115
4. Thermal radio emission of the atmosphere	118
5. Observation of atmospheric tides and other methods	119
1. Atmospheric tides	119
2. Dissipation of the atmosphere	121
Ch. IV. Temperature Measurement From Rockets and Satellites	122
1. Temperature measurement from rockets	122
1. Resistance thermometer	123
2. Manometric measurements	126
3. Measurement of sound velocity	133
4. Method of the falling sphere	136
5. Optical methods	140
2. Temperature determination from satellite observations	140
1. Determination of the density of atmosphere from the observed deceleration of satellite	140
2. Manometric measurements	148
3. Thermal sounding of the atmosphere	150
3. Heat balance and satellite temperature	153

Card 4/8

Card 5/8

S/054/60/000/02/05/021
B022/B007

AUTHORS: Kondrat'yev, K. Ya., Zigel', O. A.

TITLE: The Problem of Thermal Probing of the Atmosphere With the Aid of Photometric Data Obtained in Twilight ✓

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1960, No. 2, pp. 45-48

TEXT: The main difficulties in using the photometric method at twilight for the purpose of investigating the atmospherical structure are aerosol- and multiple scattering. In the present paper the attempt was made to investigate the influence exerted by these two factors by using celestial photographs in twilight. Measurement of sky brightness at twilight was carried out in the region of Mount Elbrus in an altitude of 3700 m above sea level; this was done during the period from July to September, 1959. Fig. 1 shows the calculations of vertical temperature distribution carried out on the basis of the mean values of all data obtained. Fig. 2 shows the time-dependence of the change in brightness at twilight in the zenith. The results obtained show that the twilight-method in its usual form ✓B

Card 1/2

The Problem of Thermal Probing of the Atmosphere With the Aid of Photometric Data Obtained in Twilight S/054/60/000/02/05/021
B022/B007

permits only an estimation of the mean temperature values. The following persons are mentioned: T. G. Megrelishvili (Ref. 5), N. B. Divari (Ref. 8), F. F. Yudalevich (Refs. 6, 7), V. G. Fesenkov (see Ref. 5), and N. M. Shtaude (Refs. 3, 4). There are 2 figures and 8 Soviet references.

✓B

Card 2/2

S/049/60/000/04/016/018
E032/E314

AUTHOR: Kondrat'yev, K.Ya.

TITLE: The Oxford Symposium on Radiation

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya
geofizicheskaya, 1960, No. 4, pp. 630 - 631

TEXT: A brief review is given of the papers read at the
above symposium. It is suggested that studies in the fields of
actinometry and atmospheric optics which are carried out in the
Soviet Union are much more comprehensive than elsewhere. On
the other hand, topical experimental and theoretical studies of
radiation streams at various altitudes in the atmosphere should
be expanded in the Soviet Union.

Card 1/1

S/050/60/000/05/15/020
B007/B014

AUTHOR: Kondrat'yev, K. Ya.
TITLE: The Spectral Albedo of the Natural Soil Covers
PERIODICAL: Meteorologiya i gidrologiya, 1960, No. 5, pp. 46-53

TEXT: It is first pointed out that the spectral albedo of natural soil covers under longwave radiation has scarcely been investigated at all so far, and a survey is then offered of the investigation results concerning the spectral albedo of natural soil covers under shortwave radiation, with special regard to such data and information as are not contained in the author's paper of Ref. 4. The following natural basements are dealt with: soils and bare sites, vegetable covers, snow covers, water basins, and the Earth as a planet. The principal characteristic of soils and bare sites is the monotone rise of the albedo with increasing wavelength in the visible region and in the near infrared region (Refs. 9, 11, 12). Investigations by L. B. Krasil'shchikov, O. I. Golikova, and Ye. P. Novosel'tsev showed that albedo becomes higher with the wavelength increasing up to about 1.1μ , whereupon, however, it begins dropping

Card 1/3

The Spectral Albedo of the Natural Soil Covers S/050/60/000/05/15/020
B007/B014

with further increasing wavelength. Mention of papers by V. I. Matulyavichene (Ref. 10), M. P. Perevertun (Ref. 13), and I. N. Yaroslavtsev (Ref. 19) is made in the survey of investigations so far conducted on the albedo of vegetable covers. It is shown in those papers that near the wavelength from $0.8-1.0 \mu$, albedo drops with increasing wavelength. On the strength of data available it is stated that the daily course of the spectral albedo of the vegetable cover is too little investigated. Mention is made of the paper by Ye. S. Artsybashev and S. V. Belov (Ref. 1), whose results confirm the existence of a rule governing the spectral course of the brightness coefficient in the visible spectral region. Reference is made to numerous investigations (Refs. 1, 6, 9, 17), by which a strong variability of the spectral albedo depending on the vegetation phase was established (Fig. 2). V. S. Tikhomirov (Ref. 17) obtained very interesting data on the season-bound variability of the spectral brightness coefficient of leaved plants and conifers in the spectral range of $0.560-0.725 \mu$. Paper of Ref. 6 contains the fullest information on the albedo of the snow cover. The daily course of the spectral albedo of the snow cover is determined by the complicated interaction between the following factors: a change in the condition of the snow

Card 2/3

The Spectral Albedo of the Natural Soil Covers

S/050/60/000/05/15/020
B007/B014

cover and of illumination. N. Ye. Ter-Markaryants (Ref. 15) carried out calculations of the albedo of water in the region of $0.214-1.256 \mu$ under direct solar irradiation. According to data supplied by N. N. Kalitin (Ref. 3) relative to the visible region of the spectrum, the albedo is strongest in the central part of the visible spectral region and fades out to both sides. As for the Earth as a planet it is pointed out that sun rays reaching the Earth are less reflected by the Earth's surface, than by clouds and atmosphere, due to an intensive radiation of diffusion. It is stated in conclusion that when analyzing the characteristic features of the spectral albedo of different natural soil covers whole classes and groups of surfaces with a common dependence of the albedo on the wavelength can be distinguished. On the strength of such an analysis, Ye. L. Krinov (Ref. 9) worked out a spectrophotometric classification of natural forms. There are 4 figures, 2 tables, and 31 references, 19 of which are Soviet. ✓

Card 3/3

KONCRAT'YEV, K.Ya.; MANOLOVA, M.P.

Measuring the radiation balance of the sea on a ship. Izv.
AN SSSR.Ser.geofiz. no.6:875-878 Ja '60. (MIRA 13:6)

1. Leningradskiy gosudarstvennyy universitet im. A.A.Zhdanova.
(Solar radiation)

84287

S/050/60/000/010/003/003
B012/B063

9.9500 2101
1301
3001

AUTHOR:

Kondrat'yev, K. Ya.

TITLE:

The Problem of the Effect of the Underlying Surface ^{2C}Albedo^{3D}
on the Conditions of Radiation in the Arctic and Antarctic
Regions ✓

PERIODICAL: Meteorologiya i gidrologiya, 1960, No. 10, pp. 29 - 30

TEXT: The total radiation yield in the Arctic and Antarctic regions is very high. It is favored by the long duration of sunshine, the high transparency of the atmosphere, and the high underlying surface albedos. It is usually assumed that all these factors favor the establishment of a positive radiation balance of the underlying surface. It is noted that if this seems fully justified for the first two factors, the rise of the albedo always diminishes the radiation balance. Though the total radiation yield in- creases considerably with increasing albedo, especially in cloudy weather, the amount of radiation absorbed by the underlying surface diminishes. Even if the lower layer is cloudy, the increase in the secondary radiation re- flection with increasing albedo is not able to compensate the simultaneous

Card 1/2

KONDRAT'YEV, K.Ya.; ZIGEL', O.A.

Thermal sounding of the atmosphere by twilight photometric
measurements. Vest.LGU 15 no.10:45-48 '60.
(MIRA 23:5)

(Atmospheric temperature)

KONDRAT'YEV, K.Ya.; MANOLOVA, M.P.

Scattered and total radiation impinging on inclined, snow-covered
surfaces. Vest LGU 15 no.16:67-73 '60. (MIRA 13:8)
(Snow) (Radiation)

32572

S/605/61/000/000/001/001
E039/E185

24,3410 (1163)

24,3420 (1153)

AUTHORS:

Kondrat'yev, K.Ya., Mironova, Z.F., Badinov, I.Ya.,
and Burgova, M.P.

TITLE:

Apparatus for measuring the spectral composition of
radiation

SOURCE:

Vsesoyuznoye soveshchaniye po svetovomu klimatu. 2d,
Moscow, 1960. Trudy, Moscow, Gosstroyizdat, 1961.
At head of title: Akademiya stroitel'stva i
arkhitektury SSSR. Institut stroitel'noy fiziki i
ograzhdayushchikh konstruktsiy. 19-31.

TEXT:

Methods of detecting and measuring the incident light
are discussed, together with methods of calibrating instruments.
Five particular types of apparatus, developed by Laboratoriya
atmosfernoy optiki, Leningradskogo gosudarstvennogo universiteta
(Laboratory of Atmospheric Optics of Leningrad State University)
are described. These are:
1) An apparatus for measuring total and scattered radiation in the
region 400-1000 mμ. This consists of a monochromator type YM-2
(UM-2) fixed to a rotating table. The optical system is of glass
Card 1/54

32572

S/605/61/000/000/001/001
E039/E185

Apparatus for measuring the ...

and the aperture 1/6. The spectrum is scanned by moving the prism
by means of a camshaft. A photomultiplier ФЭУ-22 (FEU-22) is
used as a detector at the outlet slit of the monochromator. The
scanning time over the range 420-960 mμ is 2-6 minutes, depending
on the time of day.

2) An apparatus for measuring the spectral distribution of solar
radiation and the transparency of all thicknesses of atmosphere.
This consists of a spectrophotometer on a rotating platform,
provided with an optical system for accurate lining up on the sun.
3) An apparatus for measuring the spectral intensity by a photo-
graphic method. This is based on a spectrograph type МСН-51
(ISP-51) of relative aperture 1/5.5 and a linear dispersion
~2 mμ/mm in the violet to 30 mμ/mm in the infrared. The spectro-
graph is mounted on a rotating turntable and the spectra recorded
on a cassette of film containing 20 frames. Intensities are
obtained by making exposures with a standard lamp between
successive measurements.

4) An apparatus for measuring the spectral distribution of total
and scattered radiation in the ultraviolet, visible and infrared
regions up to 1 μ. This apparatus uses a monochromator type
Card 2/54

Apparatus for measuring the ...

32572
S/605/61/000/000/001/001
E039/E185

results are also outlined. O.D. Dmitriyevskiy, B.S. Neporent and V.A. Nikitin are mentioned in the article in connection with their work in this field.
There are 10 figures and 12 Soviet-bloc references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet
(Leningrad State University)

Caption to Fig.10: Optical arrangement of a spectrophotometer with interchangeable diffraction grating. ✓

1 - entrance slit of prism monochromator. 2 - spherical mirror.
3 - plane mirror. 4 - prism of lithium fluoride. 5 - plane mirror. 6 - spherical mirror. 7 - entrance slit of the principal monochromator. 8 - exit slit of the principal monochromator.
9 - spherical mirror. 10 - grating. 11 - camshaft mechanism.
12 - photocell.

Card 4/54

GAYEVSKAYA, G. N., KONIGAT'EV, A. Ia., and MARUSHEV, A. Ia.

"The Radiative Flux Divergence and the Heat Regime in the Near-Ground Layer of the Atmosphere."

report submitted in connection with the Symposium on Radiation
Vienna Austria, 14-19 Aug 1961

KONDRAT'YEV, Kirill Ya.

"Some problems of actinometry in the free atmosphere."

"On the Heat Effects of Radiation in the Upper Atmosphere."
Report to be presented at the Symposium on Radiation, IUGG and WMO,
Vienna, Austria, 14-19 Aug 1961.

Pro-Rector, Leningrad State Univ.

S/169/62/000/003/037/098
D228/D301

AUTHOR: Kondrat'yev, K. Ya.

TITLE: Some results of and prospects for the development of actinometry and atmospheric optics

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 3, 1962, 11 abstract 3B96 (V sb. Aktinometriya i atmosf. optika, L., Gidrometeoizdat, 1961, 5-9)

TEXT: In solving practical problems in the field of meteorology, building, biology, heliotechnics, and so forth, allowance for radiation is of important significance. Therefore, the problem of radiant energy transfer is largely governed by the development of research in the field of actinometry and atmospheric optics. The IGY was an important stimulant in the development of actinometry and atmospheric optics. Successes achieved in the field of instrument construction and theoretical and experimental research are noted. At present, the spectroscopy of the atmosphere, radiation

Card 1/2

KONDRAT'YEV, K.Ya.

Meteorological research by the use of artificial earth satellites in
the United States. Meteor.i gidrol. no.7:43-49 J1 '61.

(MIRA 14:6)

(Meteorological satellites)

23584

S/053/61/074/002/001/003

B125/B203

3,2300

AUTHOR: Kondrat'yev, K. Ya.

TITLE: Satellites and meteorology

PERIODICAL: Uspekhi fizicheskikh nauk, v. 74, no. 2, 1961, 193-222

TEXT: The present paper gives a survey of non-Soviet investigations of the use of satellites for studying the lower layers of the atmosphere (troposphere and stratosphere). A table gives a survey of the American meteorological satellites. Meteorological satellites supply information on the atmosphere of the entire terrestrial globe, and large areas of the earth can be observed continuously. Circular orbits are best suited for meteorological purposes. Orbits in equatorial and polar directions would be most interesting, but a slight west deviation of the satellite orbit from the equatorial plane is necessary to compensate for the rotation of the earth round the sun. The observation of cloudiness by television is one of the most promising possibilities of using satellites for weather observation. The first test with Vanguard II on February 17, 1959 failed due to

Card 1/6

23584

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B125/B203

Satellites and meteorology

its complicated motion. The experiment with Tiros II on April 1, 1960, however, was very successful. Among other things, an orderly arranged cloud system of wide extension was observed in this way. By a mosaiclike composition of the cloud distribution, Z. Frits and G. Veksler tried to draw a map of the geographical distribution of cloudiness for a belt parallel to the equator from the US west coast to the central part of the Atlantic, and from there to the Near East. Further important problems are the choice of strata and cloud shapes, and the determination of cloud heights. Measurements of the radiation balance of the system "earth's surface - atmosphere" are important for determining the energy conditions in the atmosphere. The first test was made with Explorer VII on October 13, 1959. Qualitative estimations of the effect of various factors (described in detail in the paper) on the ratio between radiation fluxes at different altitudes are very difficult, and have not been made so far. Conclusions on the practical importance of these factors cannot be drawn as yet. T. Al'tshuler gave a formula for the radiation flux with any orientation of the surface of the radiation receiver. Table II gives the values, calculated by P. Gest, for the outgoing shortwave radiation D_{∞} and the thermal

Card 2/6

23584

S/053/61/074/002/001/003
B125/B203

Satellites and meteorology

radiation F_{∞} at different altitudes in the atmosphere for a plane and a spherical receiver. Thermal sounding of the atmosphere: D. King was the first to attempt a determination of the temperature of various layers of the atmosphere by measuring their thermal radiation with a receiver attached to the satellite. L. D. Kaplan studied, in some of his recent papers, the idea of thermal sounding of the atmosphere by measuring the outgoing radiation in various ranges of the spectrum. Table III gives the resulting effective temperatures. The available quantitative estimations of the possibility of thermal sounding from the results of measurement of the outgoing thermal radiation in various ranges of the spectrum do not yet supply dependable results. At present, the results of investigations of infrared radiation of the system "earth's surface - atmosphere" can evidently be used most efficiently for studying the horizontal thermal inhomogeneity of the earth's surface and of the atmosphere. Such data are very well suited to integrate the results found by television. Radiometeorological investigations: The basically possible radar sounding of extensive regions of the atmosphere from satellites is rendered very difficult in the practice by various factors. In scanning the atmosphere under angles of $\theta < 40^\circ$, a

Card 3/6

23584

S/053/61/074/002/001/003
B125/B203

Satellites and meteorology

narrow-focused ultrashortwave radiation must be used. The choice of the optimum wavelength depends on the most favorable ratio (intensity of reflection / degree of signal weakening). The simultaneous observation of the reflection on two frequencies permits a separation of the reflection from precipitations due to the difference in powers of the signals of the radio echo at different frequencies. For a selection of the reflection from precipitations, the difference in polarization of the reflected signals and the Doppler shift of the signal frequency due to the falling of precipitations are also suitable. Radar investigations of the precipitation zones from satellites are rather difficult. The vertical distribution of ozone can be determined from the absorption of ultraviolet solar radiation. There are 11 figures, 6 tables, and 32 references: 5 Soviet-bloc and 27 non-Soviet-bloc.

Card 4/6

S/169/62/000/006/055/093
D228/D304

AUTHORS: Kondrat'yev, K. Ya. and Manolova, M. P.

TITLE: Radiation balance and inclined surfaces

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 6, 1962, 16, abstract 6B133 (Tr. II Vses. konferentsii po svetovomu klimatu, M., Gosstroyizdat, 1961, 45-49)

TEXT: The results are stated for the investigation of the components of the radiation balance of slopes under different conditions. It is shown that only under conditions of complete cloud is it possible to utilize the "isotropic" approximation when calculating the flow of sky radiation onto slopes. For cloudless skies such an approximation gives unsatisfactory results in most cases. For gentle slopes (when the gradient angles and the slope azimuth of α are $< 30^\circ$) reflected radiation flows can be calculated from the "isotropic" approximation. For steep slopes and in cases of mirror surfaces it is necessary to take into account the angular distribution of the reflected radiation intensity. The relative

Card 1/3

S/169/62/000/006/055/093
D228/D304

Radiation balance and ...

magnitudes of the flow of solar radiation onto slopes, when the sun's elevations are more than 15°, can be approximately estimated from the "isotropic" approximation for sky and reflected radiation. The flow of solar radiation onto different slopes can be determined from graphs, cited in the work, and from the known flow of solar radiation onto a horizontal surface. The relative effective radiation of slopes can be determined from the theoretical curve, computed for the mean value of the total water-vapor content in the atmosphere. Assuming the sky and the reflected radiation to be isotropic, the daily amounts of solar radiation for slopes can be calculated with an accuracy sufficient for practical purposes from the formula:

$$\Sigma(S + D + r)_i = \Sigma S_i + \cos^2 \frac{\alpha}{2} \Sigma D_h + \sin^2 \frac{\alpha}{2} \Sigma r_h$$

Here S_i , D_i and r_i are the flows of solar, sky and reflected ra-

Card 2/3

3,5000

S/169/52/000/003/044/098
D228/D301

AUTHOR: ^N Kondrat'yev, K. Ya.

TITLE: The approximate equations of radiant energy transfer
(Theses)

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 3, 1962, 17, abstract 3B145 (V sb. Aktinometriya i atmosf. optika, L., Gidrometeoizdat, 1961, 239) ✓ B

TEXT: The problem of the approximate equations of heat-radiation transfer is considered. A numerical method is developed for calculating the temporal change in the temperature of a cloud at the time of radiant transfer, turbulence mixing, and the process of condensation. [Abstracter's note: Complete translation.]

Card 1/1

PHASE I BOOK EXPLOITATION

SOV/6054

Kondrat'yev, Kirill Yakovlevich

Meteorologicheskiye issledovaniya s pomoshch'yu raket i sputnikov (Meteorological Research by Means of Rockets and Satellites). Leningrad, Gidrometeoizdat, 1962. 251 p. 3,000 copies printed.

Resp. Ed.: O. P. Filipovich; Ed.: M. M. Yasnogorodskaya; Tech. Ed.: M. I. Braynina.

PURPOSE: This monograph may be of interest to specialists concerned with problems of the physics and meteorology of the upper atmosphere and also with the possibilities of using artificial earth satellites in weather service; it may also be used as a textbook by aspirants and students specializing in the meteorology and physics of the atmosphere.

COVERAGE: Methods and results of meteorological research by means of rockets and satellites are discussed. Methods for investigating the structure, composition, and dynamics of the upper layers of the atmosphere are discussed, as are the possibilities of using artificial earth satellites for studying weather-producing

Card 1/2

S/050/62/000/001/001/001
D207/D303

AUTHOR: Kondrat'yev, K.Ya.

TITLE: Radiation balance of the Earth as a planet

PERIODICAL: Meteorologiya i gidrologiya, no. 1, 1962, 50-56

TEXT: The author reviews recent Soviet and Western work on radiation balance. Radiation balance of the Earth is given by $R_s = Q_0 (1 - A_s) - F_{\theta}$, where Q_0 is the solar constant which

gives the amount of solar energy received by the Earth just outside the atmosphere, A_s is the Earth's albedo, and F_{θ} is the thermal radiation emitted by the Earth into space. The value of Q_0 is known to within several percent and, therefore, the author concentrates his discussion on A_s and F_{θ} . The annual mean albedo has been estimated variously as 35% and 37-40%. Its mean

Card 1/3

Radiation balance ...

S/050/52/000/001/001/001
D207/D303

annual distribution over the Earth varies greatly with latitude: 35-40% near the equator and up to 60% at 70-80°N and 60-70°S. There are also strong local and seasonal variations. The value of F_{net} (annual mean $\sim 0.3 \text{ cal cm}^{-2} \text{ min}^{-1}$) has been found to vary with altitude, season, time of day, type of radiating surface (sea or land) and other factors. The author reviews also the net radiation balance, which, of course, is zero over the whole Earth, but which varies with latitude, season and other factors. The author concludes that the greatest progress in the extension of the knowledge of radiation balance can be expected from satellite experiments. There are 3 figures, 3 tables and 30 references: 14 Soviet-bloc and 16 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: W.M. Elsasser and M.F. Culbertson, "Atmospheric radiation tables", Meteorological Monographs, vol. 4, no. 25, American Meteorological Society, August 1960; R.W. Fern and H.K. Weickmann, J. Geophys. Res., 65, no. 11,

Card 2/3

Radiation balance ...

S/050/52/000/001/001/001
D207/D303

1960; J.V. Hales, T.L. Williams and D. Henderson, "Calculation of infrared radiative flux of the Earth plus atmosphere at various levels high above the Earth", Final Report AFCRL-TR-60-405, August 1960; J.V. Hales, T.A. Studer and D. Henderson "Atmospheric radiation flux in the 6.3 micron to 8.2 micron interval", Scient. Report no. 2, AFCRL-TN-60-638, August 1960

Card 3/3

KONDRAT'YEV, K.Ya.; BURGOVA, M.P.; GOL'M, T.S.

Distribution of energy in the spectrum of total and diffuse
radiation. Trudy Astrofiz.inst.AN Kazakh.SSR 3:66 '62.
(MIRA 16:11)

S/026/62/000/005/003/010
D036/D113

AUTHOR: Kondrat'yev, K.Ya., Professor (Leningrad)
TITLE: Artificial satellites and clouds of the Earth
PERIODICAL: Priroda, no. 5, 1962, 41-46

TEXT: The use of artificial satellites in meteorology, especially in cloud studies, is discussed. Specific fields of application are mentioned, such as research into the thermal stratification and composition of the atmosphere, radar examination of clouds and precipitations, and energy distribution in the ultraviolet solar spectrum. Polar and equatorial circular orbits are considered to be the most practical. Satellites on an equatorial orbit at a height of 35000 km would remain constantly over the same spot, and form a system for receiving and transmitting information from other weather satellites. Satellites at various heights would provide weather information on various scales. Cloud information obtained by the "Tiros-1" is illustrated, discussed and analyzed. Examination of cloudiness with the aid of the "Avangard II" was impossible because of failure in controlling the

Card 1/2

44830

S/560/62/000/014/001/011
A001/A101

3.5110

AUTHORS: Kondrat'yev, K. Ya., Yakushevskaya, K. Ye.

TITLE: The angular distribution of outgoing thermal radiation in various bands of the spectrum

SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli. no. 14, 1962, 13 - 29

TEXT: The purpose of the present article is studying regularities in angular distribution of intensity of thermal radiation outgoing from the Earth, as a planet, in various bands of the spectrum, using the method of theoretical calculations. The latter are based on phenomenological equations of radiation transfer with long wavelengths, which are integrated by the graphical method. The most recent data are used for quantitative characteristics of infrared radiation absorption. At first calculations were carried out for the conditions of some idealized, averaged stratification of the atmosphere. The radiation field was calculated for a point located at an altitude of 300 km and latitudes of equator ($\varphi = 0$) and $\varphi = 65^\circ\text{N}$. The calculated values of angular distribution

Card 1/2

The angular distribution of outgoing...

S/560/62/000/014/001/011
A001/A101

of outgoing radiation intensity $U(\vartheta)$ (ϑ - zenith angle) are presented graphically. An analysis of the curves shows that absolute changes in radiation intensity with latitude are considerably less than changes caused by changing conditions of cloudiness in the most bands of the spectrum. The changes of $U(\vartheta)$ with latitude are the less the farther is the band of the infrared spectrum. A concept of relative intensity of outgoing radiation is introduced, which is defined as the ratio $U(\vartheta)/U(0)$, where $U(0)$ is intensity of radiation in nadir. The phenomenon of infrared "darkening" toward the boundary of the atmosphere occurs more sharply, steep and rapid in the band 10.55 - 11.01 microns than in other spectrum bands. The calculations were performed on assumption of an atmosphere which is quasisymmetrical with respect to distribution of temperature and absorbing gases. Under actual synoptic conditions, azimuthal variation of $U(\vartheta)$ may be considerably larger. Next the concept of relative magnitude of radiation flux $F(\vartheta_0)/F(0)$ is introduced and it is shown that angular distributions of both ratios, relative intensities and relative fluxes, coincide within the range of angles $0 - 70^\circ$. There are 10 figures and 5 tables.

SUBMITTED: February 26, 1962

Card 2/2

44836

S/560/62/000/014/008/011
A001/A101

3.5110

AUTHORS: Kondrat'yev, K. Ya., Gayevskaya, G. N., Nikol'skiy, G. A.
TITLE: The vertical profile of radiation balance and its components in
the free atmosphere in day-time
SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli. no. 14, 1962,
86 - 94

TEXT: The authors describe a set of day-time measurements of radiation balance and its components and their studies of the structure and composition of the atmosphere (temperature, pressure, humidity, ozone content), troposphere and stratosphere. A special automatic equipment for lifting by a balloon was designed. This set of equipment makes it possible to perform continuously measurements and recording of summary, direct solar and reflected radiation, radiation balance and total ascending radiation flux, total ozone content, temperature, humidity and pressure of air, and temperature of actinometric and recording devices. Standard Yanishevskiy's pyranometers and balance-meters are used. The instruments are described and the method of recording the results is indicated. Two ascents were

Card 1/2

The vertical profile of radiation balance and...

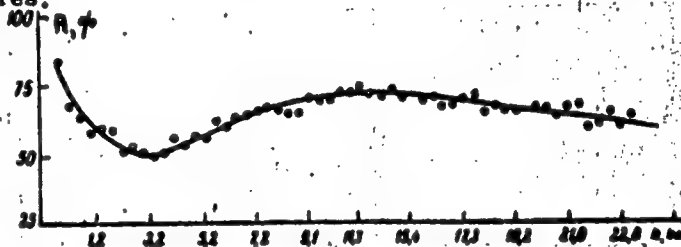
S/560/62/000/014/008/011
A001/A101

performed: on June 7, 1961, and November 14, 1961. The results of measurements are described and illustrated graphically. The maximum of radiation balance was found to take place at an altitude of 2 - 3 km. Extremal values of radiation balance were: 0.30 and 0.44 cal.cm⁻²min⁻¹. The values of albedo were calculated from the measured values of reflected and summary radiation; they are shown in Fig. 6. Albedo has maximum near the ground surface and diminishes to a minimum (~50%) at an altitude of 3.4 km. The second maximum is attained at an altitude of ~13 km. Inhomogeneities in the variation of the radiation balance were noted in both flights; they were due to horizontal inhomogeneity of the underlying surface and high concentration of aerosol in the lower atmospheric layers. In conclusion the authors enumerate the main tasks which call for solution in the immediate future. There are 6 figures.

SUBMITTED: February 26, 1962

Figure 6. Altitude distribution of albedo (November 14, 1961).

Card 2/2



KONDRAT'YEV, K.Ya.; FEDOROVA, M.P.

Processing and analyzing some data obtained by the
measurement of components of the radiation balance of
the system "earth's surface-atmosphere" from the Tiros-2
satellite. Isk.sput.Zem. no.14:95-104 '62. (MIRA 15:11)
(Artificial satellites in meteorology)
(Atmosphere)
(Heat—Radiation and absorption)

44837

S/560/62/000/014/009/011
A001/A101

9.6150

AUTHORS: Kondrat'yev, K. Ya., Fedorova, M. P.

TITLE: Fluxes of outgoing long-wave radiation incident onto differently oriented surfaces

SOURCE: Akademiya nauk SSSR. Iskusstvennye sputniki Zemli. no. 14, 1962, 133 - 136

TEXT: Fluxes of long-wave (thermal) and short-wave (solar) outgoing radiation are non-isotropic. Therefore, angular distribution of outgoing radiation intensity is essentially non-monotonous and varies in dependence of particular conditions. The authors calculate fluxes of long-wave radiation outgoing from the Earth and incident onto differently oriented inclined plane surfaces located in the atmosphere at an altitude of 300 km. Calculations are performed for surfaces inclined at the angle α equal to 10, 20, 30, 40, 50, 60, 70, 80, 90° and for a horizontal surface, for a point located above the equator ($\varphi = 0^\circ$) and above latitude $\varphi = 65^\circ$ N. The angular distribution was calculated for summer and for three cases: cloudless atmosphere and belts of continuous cloudiness with upper

Card 1/3

Fluxes of outgoing long-wave radiation incident onto... S/560/62/000/014/009/011
A001/A101

boundaries of clouds at altitudes 3 and 9 km. On the basis of intensity angular distribution data, radiation fluxes onto inclined surfaces were calculated by numerical integration by the formula:

$$F = \sum_k I(\vartheta_k) \cos i_k \Delta \Omega_k \quad (3)$$

where $I(\vartheta_k)$ is radiation intensity in direction of nadir angle ϑ_k , which is the central angle for a k-th section of the Earth's surface "seen" at an angle equal to $\Delta \Omega_k$; i is angle of incidence beam onto the given surface. The results of calculation are presented graphically and in tables. (See Fig. 1 and 2). There are 2 figures and 2 tables.

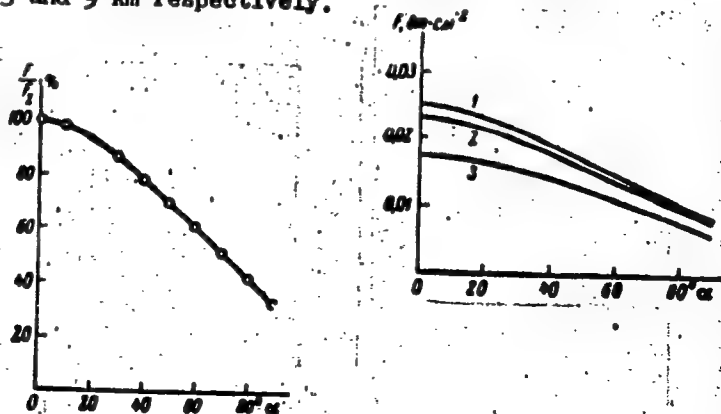
SUBMITTED: February 26, 1962

Card 2/3

Fluxes of outgoing long-wave radiation incident onto... S/560/62/000/014/009/011
A001/A101

Figure 1. Dependence of the outgoing radiation flux on the angle of surface inclination (equator). 1- cloudless atmosphere; 2,3 - continuous cloudiness with upper boundary at altitudes 3 and 9 km respectively.

Figure 2. Dependence of the relative flux of outgoing radiation F/F_{hor} (flux onto a horizontal surface) on the angle surface inclination (equator).



Card 3/3

KONDRAT'YEV, K.Ya., prof. (Leningrad)

Investigation of the upper layers of the atmosphere; an international symposium on outer space. Priroda 51 no.12:56-58 D '62.
(MIRA 15:12)

(Outer space—Exploration)
(Atmosphere, Upper—Rocket observations)

KONDRAT'YEV, K.Ya.

Symposium on Radiation, held in Vienna on August 14-19,
1961. Usp. fiz. nauk 76 no.1:171-179 Ja '62. (MIRA 15:2)
(Radiation—Congresses)

KONDRAT'YEV, K. Ya.

Third International Symposium on the Exploration of Outer Space
held at Washington, May 1-8, 1962. Usp. fiz. nauk 78 no.1:167-179
S '62. (MIRA 15:9)

(Space sciences--Congresses)

KONDRAT'YEV, K.Ya., prof., red.; KORACHEVSKIY, V.G., dots., red.;
TSAR'KOVA, Z.I., red.

[Problems in atmospheric physics] Problemy fiziki atmosfery. No.2. 1963. 190 p. (MIRA 17:7)

1. Leningrad. Universitet.

KONDRAT'YEV, Kirill Yakovlevich; VLASOVA, Yu.V., red.; BRAYNINA, M.I.,
tekhn. red.

[Meteorological satellites] Meteorologicheskie sputniki. Le-
ningrad, Gidromet.izd-vo, 1963. 310 p. (MIRA 16:4)
(Artificial satellites)

KONDRAT'YEV, Kirill Y., GAYEVSKAYA, G. N., NIKOL'SKIY, G. M.,

"Balloon investigations of tropospheric and stratospheric radiative regime"

Report to be submitted for the 13th General Assembly, Intl. Union of Geodesy and Geophysics (IUGG), Berkeley Calif., 19-31 Aug 63

6OND RAT'YEV, K.YA.; MALKEVICH, M.S.

"Radiation and Meteorological Satellites" and "Interpretation of Radiation observations from Satellites"

Report presented at the 5th Conference on Atmospheric Optics and Actinometry,
Moscow, 24-29 June 1963

ACCESSION NR.: AT4033367

S/2960/63/000/002/0003/0027

AUTHOR: Kondrat'yev, K. Ya.; Niylik, Kh. Yu.

TITLE: Thermal radiation of the 9.6-micron absorption band of atmospheric ozone

SOURCE: Leningrad. Universitet. Problemy* fiziki atmosfery*, no. 2, 1963, 3-27

TOPIC TAGS: meteorology, ozone, troposphere, counterradiation, atmospheric thermal radiation, atmospheric water vapor, atmospheric stratification, tropopause, atmospheric vertical temperature gradient, earth radiation balance, atmospheric outgoing radiation, stratosphere

ABSTRACT: A study of recent experimental data has been made to determine the absorption (transmission) function of the atmosphere in the region of the ozone band (9.0-10.3 microns) and use the derived absorption (transmission) function for investigation of the dependence of the flux of thermal radiation of ozone on various factors (change of the content and stratification of O_3 and H_2O in the atmosphere, thermal stratification, etc.). The investigation also sought to establish what fraction of the flux of thermal radiation in the spectral region 9-10.3 microns is in relation to the total flux of atmospheric thermal radiation. The data are from the literature, rather than from original research. Critical review

Card 1/3

ACCESSION NR.: AT4033367

of these data indicate that absorption of radiation by water vapor in the region 9-10.3 microns strongly influences the results of determination of atmospheric counterradiation $G_{\Delta\downarrow}(z = 0)$ in this region of the spectrum. The decisive factors for $G_{\Delta\downarrow}(z = 0)$ and $F_{\Delta} z = 0$ (where $G_{\Delta\downarrow}$ and $G_{\Delta\uparrow}$ are descending and ascending fluxes and F_{Δ} is effective radiation) are the water vapor content and vertical distribution of temperature in the troposphere. The influence of ozone dominates only when there are very small quantities of water vapor and a large ozone content. At the tropopause and farther aloft the absorption of radiation by water vapor and the change of the H_2O content in the troposphere only slightly influences the results of determination of $G_{\Delta\uparrow}$. The principal factors here are the vertical distribution of temperature and the temperature of the earth's surface. Since $G_{\Delta\downarrow}$ averages less than 5% of the corresponding total flux of atmospheric counterradiation G_{\downarrow} and water vapor plays the principal role in determination of $G_{\Delta\downarrow}$, the influence of ozone on G_{\downarrow} , and therefore on the radiation balance of the earth's surface, is extremely insignificant. Stratospheric ozone has a still smaller influence on the total flux of outgoing radiation. It is concluded that in computations of the total flux of thermal radiation which do not require high accuracy the influence of ozone can be neglected. It appears doubtful that the results of surface measurements of atmospheric radiation in the region of the 9.6μ band of ozone can be used for determination of the vertical distribution of

Card 2/3

ACCESSION NR.: AT4033367

ozone. Orig. art. has: 20 formulas, 7 figures and 10 tables.

ASSOCIATION: Leningradskiy universitet (Leningrad University)

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DATE ACQ: 23Apr64

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SUB CODE: ES

NO REF SOV: 008

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Card 3/3

ACCESSION NR: AT4033368

S/2960/63/000/002/0028/0047

AUTHOR: Kondrat'yev, K. Ya.; Niylik, Kh. Yu.

TITLE: The thermal radiation of carbon dioxide gas in the atmosphere

SOURCE: Leningrad. Universitet. Problemy* fiziki atmosfery*, no. 2, 1963, 28-47

TOPIC TAGS: atmospheric physics, atmospheric transmission, atmospheric carbon dioxide, atmospheric thermal radiation

ABSTRACT: Recent theoretical and experimental data have been used to determine the absorption (transmission) function of the atmosphere in the 12-18 micron region. The derived function has been used for investigation of the dependence of the flux of thermal radiation of carbon dioxide gas on various factors (change in the concentration of CO₂ and H₂O in the atmosphere, thermal stratification of the atmosphere, and others). In determining the transmission function of the atmosphere in the spectral region 12-18 microns the function will be dependent on both the content of carbon dioxide gas and on the content of water vapor. A change in the content of carbon dioxide gas in the atmosphere appreciably influences counterradiation only if the presence of water vapor in the atmosphere is not taken into account, but this case is not of practical significance because the atmosphere always contains both carbon dioxide gas and water vapor. In other cases changes in

Card 1/2

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counterradiation as a result of an increase or decrease in the CO_2 content are extremely small. The greater the total water vapor content in the atmosphere, the weaker is the dependence of counterradiation on a change in the quantity of CO_2 . In the zones $0-10^\circ\text{N}$ and $40-50^\circ\text{N}$ G_{12-18} is almost independent of the CO_2 content of the atmosphere. In the zone $80-90^\circ\text{N}$ the water vapor content of the atmosphere is insignificant and variations in the concentration of CO_2 will have an appreciable influence on G_{12-18} . However, as a result of a decrease of the CO_2 concentration from 0.027 to 0.015% the counterradiation in this latitude zone decreases only by 0.002 cal/cm²min. G_{12-18} constitutes on the average only about 30% of the total counterradiation G_0 of the atmosphere. A change in the water vapor content in the atmosphere influences the value G_{12-18} far more than a change in the content of CO_2 . In the case of a temperature inversion the influence of a change in the content of CO_2 and water vapor on counterradiation is somewhat less than when there is a normal stratification. Orig. art. has: 5 figures, 17 formulas and 12 tables.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

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SUB CODE: AADATE ACQ: 23Apr64
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OTHER: 019

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ACCESSION NR: AT4033369

5/2960/63/000/002/0048/0066

AUTHOR: Kondrat'yev, K. Ya.; Yakushevskaya, K. Ye.

TITLE: The problem of the spectral distribution of outgoing radiation

SOURCE: Leningrad. Universitet. Problemy* fiziki atmosfery*, no. 2, 1963, 48-66

TOPIC TAGS: meteorology, atmospheric outgoing radiation, radiation spectrum

ABSTRACT: In this paper the authors have determined the intensity of atmospheric outgoing radiation at the nadir in 27 spectral parts of the 1-18 μ region (in the interval 1-12 μ intensity also was determined for a zenith angle $\vartheta = 30^\circ$). The basis for the computations is recent experimental data on absorption of long-wave radiation by water vapor, carbon dioxide and ozone. The following typical atmospheric stratifications are used in the study: 1) winter, arctic air mass; 2) winter, continental polar air mass; 3) summer, continental polar air mass; and 4) summer, monsoon air mass. The results of the computations of atmospheric radiation are shown in Figures 1-9 of the Enclosure; these constitute the principal contribution of the study. "The authors wish to thank A. D. Poddubik and other associates for performing the tedious computation work." Orig. art. has: 5 formulas, 9 figures and 2 tables.

Card

1/12

ACCESSION NR: AT4033370

S/2960/63/000/002/0067/0086

AUTHOR: Kondrat'yev, K. Ye.; Burgova, M. P.; Grishechkin, V. S.; Mikhaylov, V.V.; Petelin, G. M.

TITLE: Investigation of the spectral distribution of short-wave radiation

SOURCE: Leningrad. Universitet. Problemy fiziki atmosfery*, no. 2, 1963, 67-86

TOPIC TAGS: meteorology, atmospheric physics, meteorology, short-wave radiation, spectrophotometer, direct solar radiation, scattered solar radiation, spectral albedo

ABSTRACT: Specialists at the LGU (Leningrad State University) are carrying out an extensive program of study of short-wave radiation; various aspects of this program at the Kafedra fiziki atmosfery* (Department of Atmospheric Physics) are described. The atmospheric optics laboratory of this department has been developing a special set of spectrophotometric apparatus for measurement of the spectral characteristics of direct and scattered solar radiation, integral sky radiation in the short-wave region of the spectrum and the spectral albedo of underlying surfaces. This article gives a brief description of the mentioned apparatus. A high-speed automatic spectrophotometer, shown in Fig. 1 of the Enclosure, has been developed for measurement of the spectral characteristics of direct solar radiation.

Card 1/4

ACCESSION NR: AT4033370

tion and spectral sky brightness (in a limited solid angle) in the short-wave region of the spectrum. The instrument consists of four basic units: light flux obturator, a monochromator with a diffraction grating, a receiving and recording unit and a source of standard radiation. The working region of the monochromator is 250-1000 millimicrons; photomultipliers are used as radiation detectors; light filters are placed in front of the photomultipliers to attenuate the scattered light; the standard radiation source is used to check the stability of the instrument sensitivity factor; there is a mounting and base which makes it possible to point the instrument at any point in the sky. The fluxes of total and scattered radiation in the 0.29-1.1 μ region are measured by a SFD-1 monochromator with a diffraction grating with 600 rulings/mm. The receiving part of the instrument is a spherical photometer 200 mm in diameter. The recording instrument is a 1-second EPP-09 electronic potentiometer. The instrument for measurement of sky brightness by the photographic method is a modified ISP-51 spectrograph; the working region of the instrument is 360-600 millimicrons. The method used for processing the results involves the use of two characteristic curves, making it possible to decrease the measurement error by graphic averaging of the results. The spectral albedo of underlying surfaces is measured by a remote-control spectrometer operating in the region 440 millimicrons - 1 micron. Some of the results obtained using these instruments are given in tables and graphs. Orig. art. has: 10 figures and 6 tables.

Card 2/4

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ASSOCIATION: Leningradskiy universitet (Leningrad University)

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Card 3/4

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ENCLOSURE: 01

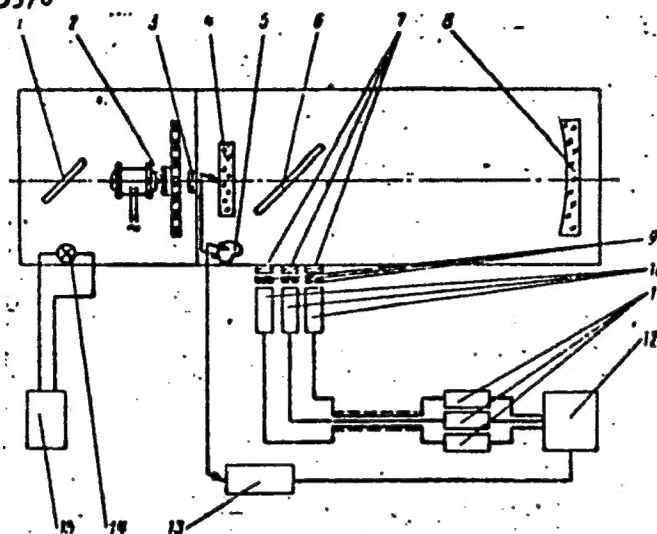


Fig. 1 -

Block diagram of a high-speed spectrophotometer with diffraction grating. 1 -- semi-transparent mirror; 2 - modulator; 3 - entrance slit; 4 - replica; 5 - cam of oscillating device; 6 - flat mirror; 7 - exit slit; 8 - spherical mirror; 9 - light filters; 10 - radiation detectors with preamplifiers; 11 - selective amplifiers; 12 - recording device; 13 - wavelength scale marker; 14 - source of standard radiation; 15 - power source for standard radiation source.